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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/713,777

11/13/2003

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EXAMINER

BOLDA, ERIC L

ART UNIT

PAPER NUMBER

3663

MAIL DATE

DELIVERY MODE

08/14/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/713,777	Applicant(s) NAKAGAWA ET AL.	
	Examiner ERIC BOLDA	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-7,12-14 and 18-29 is/are pending in the application.
- 4a) Of the above claim(s) 22-24 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-7,12-14 and 25-29 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 18-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 22, 2009 has been entered.

Response to Arguments

2. Applicant's arguments **A**, see Remarks/Arguments, filed May 22, 2009, p. 8 with respect to the 35 USC 112 (2nd para.) rejection of claims 1 and 18-21 have been fully considered and are persuasive. The 35 USC 112 (2nd para.) rejection of claims 1 and 18-21 has been withdrawn.

3. Applicant's arguments **B**, see Remarks/Arguments, filed May 22, 2009, p. 8-9 with respect to the 35 USC 103(a) rejection of claim 1 has been considered but is moot in view of the new grounds of rejection. A newly discovered reference teaches the claim limitations argued: the controller configured to inject a dc current.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zah (US 6,434,175) in view of Koch (US 5,394,489) and further in view of Yamakawa et al. (US 4,954,786).

Regarding claim 1, Zah discloses, an optical module arranged in an optical transmission path, comprising:

- an optical amplifying unit [Fig. 8, #210] configured with a semiconductor [Col. 7, line 38] and disposed in series with and behind [Fig. 8, #210-410] an optical amplifying unit [Fig. 8, #210], wherein the optical amplifying unit amplifies in high gain light input from the optical transmission path [Fig. 8, horizontal axis of fig 8 to the right of #210 reads on this]; and

- an optical element [Fig. 8, #410] configured with a semiconductor [Modulator is disclosed as monolithically integrated with Phasar/DBR in Col. 7, line 4. Phasar/DBR contains an SOA (Col. 6, line 58). Therefore, the modulator is made of semiconductor.], wherein the optical element [Fig. 8, #410] includes an optical modulator [Col. 7, line 24], and propagates the light [Arrow at right of figure 8] amplified by the optical amplifying unit [Fig. 8, #210] to the optical transmission path [horizontal axis of figure 8]

but fails to disclose that:

"[the SOA] is operative to produce gain of the optical amplifying element is sufficiently high that insertion loss of the optical module is completely compensated."

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- The modulator is in series with and behind the optical amplifying unit
- The optical modulator is a directional optical modulator

Koch teaches a laser similar to that of Zah, but has additional disclosure of the optical modulator used, including that it can be before or after the optical amplifier [Col. 3, lines 40-46], and that it can be a directional optical modulator

[Col. 2, line 50]. Zah teaches in [Col. 2, lines 11-24] that an SOA is optional, and in [Col. 2, lines 25-35] that the insertion loss of the modulators is 3dB or more, and that the single pass loss of the path is 1-2dB [Fig. 6-7.] With the modification of Fig. 3 of Koch, it becomes possible to correct for this loss by changing the gain to compensate for the single pass loss, which is not possible if the modulator is lossy and in front of the SOA. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to choose an SOA with more than 3dB of gain, and placing it in front of a directional coupling modulator as taught by Koch, for the advantage of optimizing the power and SNR of the Phasar/DBR disclosed in Fig. 8 of Zah. Neither Zah nor Koch give details of the controller for the DC current injected into the SOA, although some means of control is required in order to operate the SOA. Yamakawa specifically teaches a controller for an SOA. Fig. 8 shows the controller (81) operatively connected to the SOA (14). The controller generates a control signal to control the current source (17), thereby setting the gain of the amplifier (3rd col. lines 23-26). The level of gain can be set by the reference value (3rd lines 35-37). It would have been obvious to one skilled in the art (e.g. an optical engineer) to include a dc current controller for the current required in the

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SOA, in the device of Zah, setting the gain to compensate for the single pass loss as taught by Koch, because the output is stabilized against oscillations due to changing temperature and signal characteristics (Yamakawa, 1st col. lines 31-40).

Allowable Subject Matter

6. Claims 4-7, 12-14 and 25-29 are allowed.
7. Claims 18-21 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims they are dependent on.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric Bolda whose telephone number is 571-272-8104. The examiner can normally be reached on M-F from 8:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Jack Keith, can be reached on 571-272-6878. Please note the fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Eric Bolda/

Primary Examiner, Art Unit 3663